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NORTHWEST JOURNAL OF OPTOMETRY
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S. H. ROBINSON MULTIPLE RECORD CARD

Samuel H. Robinson, Opt.D., F.A.A.O.
Prescott, Arizona

For several years the writer has experienced a growing sense of being handicapped in the matter of making suitable records of refractive data. In the beginning, the old-fashioned 3x5 inch card, carrying nothing beyond the prescription and bridge measurements sufficed his needs. Later, as he awakened to the value of retaining a record of the several steps involved in his refractive examinations, he resorted to other means, making use for some time, of a plain record card, upon which he inscribed all the findings he considered necessary to preserve in record form. More recently, however, the writer has found this manner of recording data quite impractical, and he was confronted with the task of designing a printed card which would carry all the data **really essential** to modern optometric practice. How this has come about, we shall see later.

In a perfunctory sort of way, optometrical schools have been teaching for years the importance of enforced ciliary relaxation, to which process has been given the name of "repression" or "suppression" as some prefer to call it. It was not until quite recently however, that practitioners began to realize that this relaxation process might be of value not alone in specially selected cases, but in all refractive work, as well.

Still more recently, the writer—as well as other practitioners, no doubt—has become strongly impressed with the need of making duplicate tests of the several steps which comprise an optometric examination. Not alone are such duplicate tests necessary to study the changing refractive status uncovered by repression influence, but other factors enter, which likewise justify the plan. We know for instance, that the eyes is a highly flexible organ susceptible to whims and refractive changes not attributable to apparent cause. The writer has observed numerous cases in his own practice, which expressed variable acuities from perhaps 20/100 at one time, to normal vision at another—the reverse also being true.

Such type cases seem obviously in need of some form of ciliary treatment or stabilization before conclusive results may be anticipated. But regardless of what attitude we may hold toward this form of practice, there are other reasons why better judgment should dictate that a prescription written from steps that have not been corroborated by subsequent tests is liable to be faulty. And if the precaution of more than a single examination be heeded, then certainly, a record of the duplicate findings is highly important. It is these facts, among other things, that prompted the writer to design his multiple-record card, an illustration of which is here presented for the reader's inspection.

A matter of even wider importance —at present at least—is a means for recording extra-ocular muscle conditions and the innervational response or changes effected by prismatic exercises. A comprehensive record card covering this branch of optometric work, was not to be procured. Thus devolved the necessity of designing a record card which would not alone record the duplicate steps in a thorough refractive examination, but one that would embrace the field of prismatic treatment as well. That the field of oculo-prism treatment is in a somewhat chaotic condition is more or less apparent. The most lucid text upon this subject must still leave procedure, haphazard, and at the mercy of individual fancy or interpretation.

The author's multiple-record card not alone provides room for recording muscle treatment, but it co-ordinates and unifies procedure, by outlining the essential steps in an order that is both simple and practical. Here is expressed the writer's strongest conviction as to

OCULO-PRISM TREATMENT

MUSCLE TESTS BEFORE TREATMENT

DATE

DISTANCE TESTS

ESO.
EXO.
R. H.
L. H.
CYCL.

NEAR TESTS

ESO.
EXO.
R. H.
L. H.
CYCL.

MUSCLE TESTS AFTER TREATMENT*

DATE

DISTANCE TESTS

ESO.
EXO.
R. H.
L. H.
CYCL.

NEAR TESTS

ESO.
EXO.
R. H.
L. H.
CYCL.

*PERMIT EYES TO REST 10 TO 15 MINUTES BEFORE MAKING FINAL TEST

MAXIMUM DUCTION TESTS

DATE

DISTANCE TEST WITH RED DISC AND SPOT

ABD.
ADD.
APEX UP R. E. OR L. E.*
APEX DOWN R. E. OR L. E.*

DISTANCE TEST WITH SPOT ONLY

ABD.
ADD.
APEX UP R. E. OR L. E.*
APEX DOWN R. E. OR L. E.*

DISTANCE TEST WITH LETTERS

ABD.
ADD.
APEX UP R. E. OR L. E.*
APEX DOWN R. E. OR L. E.*

NEAR TEST WITH RED DISC AND SPOT

ABD.
ADD.
APEX UP R. E. OR L. E.*
APEX DOWN R. E. OR L. E.*

NEAR TEST WITH SPOT ONLY

ABD.
ADD.
APEX UP R. E. OR L. E.*
APEX DOWN R. E. OR L. E.*

NEAR TEST WITH LETTERS

ABD.
ADD.
APEX UP R. E. OR L. E.*
APEX DOWN R. E. OR L. E.*

*Strike out "R. E." or "L. E." Depending on which eye is given the prism.

	$
EXAMINATION FEE	
REPRESSION WORK	
OCULO-PRISM TREATMENT	
PRICE OF FRAME	
PRICE OF LENSE	
TOTAL	
DEPOSIT	
BALANCE DUE	

*REMARKS

*PATIENTS HISTORY, COMPLAINT, OR EXTRA DATA ON OCULAR EXAMINATION.

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Figure 1

DATE_____ NAME_____

PHONE_____ RESIDENCE_____

AGE_____ SEX_____ OCCUPATION_____

℞ No.	SPHERE	CYL.	AXIS	PRISM	BASE
DIS. O.D.					
DIS. O.S.					
NEAR O.D.					
NEAR O.S.					
ADD. O.D.		SEGMENT SIZE			
ADD. O.S.		SEGMENT DISPLACED IN EACH			

SIZE EYE_____

STYLE LENS_____

KIND OF GLASS_____

KIND OF BIFOCAL_____

NO. HOLES PER PR._____

P. D._____

B. HEIGHT_____

CREST_____

BASE_____

ANGLE_____

MOUNTINGS

SPECTACLE OR EYEGLASS

STYLE OR MAKE_____

TEMPLES KIND & LGT._____

STYLE GUARD

ACUITY NAKED EYE O. D._____ O. S._____ O. U._____

ACUITY WITH CORRECTION O. D._____ O. S._____ O. U._____

OPTHALMOSCOPIC EXAM.

SPHYGMOMENOMETER

DATE	SYS.	DIAS.	P. P.

Date		
	OPTHALMOMETER O. D.	_____ AXIS _____ / _____ AXIS _____
	OPTHALMOMETER O. S.	_____ AXIS _____ / _____ AXIS _____
	OPTHALMOMETER O. D.	_____ AXIS _____ / _____ AXIS _____
	OPTHALMOMETER O. S.	_____ AXIS _____ / _____ AXIS _____
	STATIC RETINOSCOPY O. D. / O. S.	
	STATIC RETINOSCOPY O. D. / O. S.	
	STATIC RETINOSCOPY O. D. / O. S.	
	DYNAMIC RETINOSCOPY O. D. / O. S.	
	DYNAMIC RETINOSCOPY O. D. / O. S.	
	SUBJECTIVE TEST O. D. / O. S.	
	SUBJECTIVE TEST O. D. / O. S.	
	SUBJECTIVE TEST O. D. / O. S.	

AMPLITUDES OF ACC. WITHOUT AND WITH CORREGTION

WITHOUT		WITH COR.	
O. D. =		O. D. =	
O. S. =		O. S. =	
O. D. =		O. D. =	
O. S. =		O. S. =	
O. D. =		O. D. =	
O. S. =		O. S. =	

Figure 2

form and type of treatment. As has once been said, the practitioner using this card needs but know how to make the tonicity and duction tests, to give fairly dependable muscle treatment. The steps are already outlined for him; all that is necessary, is but to follow them. The finer points, are as yet, of course, to be mastered. But this will inevitably follow upon proper diligence and application.

A feature of the multiple-record card which is especially valuable is the improved manner of recording amplitude findings. It is surprising what little thought has been given a matter of such grave importance. Amplitude measurements may be made, and in fact should be made, both **with** and **without** correction before the patient's eyes. By the latter method we measure the accommodative resources when burdened by refractive error as well as accommodative impairment. By the former method, accommodative weakness alone is indicated.

But there are other reasons why amplitude findings must be made with refractive correction as well as without. The presbyopic near point without refractive assistance is usually too far removed to determine visually or mechanically. We often find in such cases that not even the distant correction will suffice to bring the near point within measurable distance. It is valuable, furthermore, that we establish a **near-point** as well as a **far-point** for our presbyopic corrections. For by this **reading-range,** may we form some idea as to the comfort that will be permitted by the reading lenses. Such **near-point** as well as **far-point** findings cannot be determined without the aid of refractive correction. Whatever the circumstances may be, and whatever the practitioner's mode or purpose, a modern optometric record card must make provision for amplitude findings both **with** and **without** refractive correction.

An ideal record card for popular consumption must be made of standard size. It may be modern and comprehensive to the last degree, but it must not confuse the essential steps and commonly recognized procedure, by including highly controversial data, or the many transient whims of individual practitioners aired from time to time, through various publications. If the writer should ever be criticized on this score, for introducing multiple or repetitive tests in the card he now presents, he can offer justification not alone on the basis of its common-sense utility as has been here and elsewhere presented, but on the proposition that a multiple record card really serves the purpose of several cards instead of one. And herein lie special advantages.

Every practitioner has occasion to re-examine many of those whom he has formerly rendered service. As a result the files are cluttered up with old and obsolete prescriptions, often useful for comparative reference, but otherwise detrimental if not actually obnoxious when looking up a patient's former record. Upon the multiple-record card dates are reserved for all refractive tests or examinations. A latter test can be distinguished from a preceding one not alone by its position on the card, but by the date as well. A subsequent prescription made up in lenses, is recognized by encircling it, and passing a line through those that have become obsolete. Fewer cards are thus required to one's practice, while a comprehensive survey of all the service rendered a single patient is made available at almost a glance. The multiple-record card may be used therefore to make corroborative tests during a single examination; for conducting "repression" work, and in lieu of several cards when making as many separate examinations of a given patient.

The size of a record card is often one of the first considerations. Bearing this fact in mind, the writer made extensive inquiry upon this subject. The popular demand seemed to dictate a 4x6 inch card, hence that size was selected. The question of filing cabinets also justified consideration. Those who must change their cabinets for one accommodating the newly designed card, are often reluctant to incur the added expense. The writer has found a very satisfactory cabinet in the fibre box that may be purchased at any book store, for not to exceed $1.00. He is now using this very type filing device, with utmost satisfaction.

To design upon a 4x6 inch card (Figs. 1 and 2) all the data which multiple records and a full course of muscle treatment must necessarily in-

volve, is no simple task. This could be accomplished only by eliminating unnecessary and superfluous data, and by such careful arrangement of detail as to conserve all available space. To give the examiner still more room and greater freedom to express the results of his examinations, he is advised to indulge in the use of practical abbreviations and symbols as much as possible. Thus, a question mark (?) placed beside uncertain data would at once indicate that the findings are doubtful. In like manner space will be saved by using numerals for expressing the months of the year, and in prismatic work, where treatment is administered each day or alternate day, the month is even omitted, being indicated perhaps at the first treatment only. For other forms of abbreviations, marks, or symbols which may be utilized with profit and which lend special value to the card, the reader is referred to the writer's article upon the subject, published in the **Optometric Weekly** in its issue of April 9th. One will find it helpful, when recording muscle data especially, to use clear ink with a fine point pen. Two digits, which is the maximum ever recorded in prismatic work, will then space well in the squares provided for this data.

The sections indicated "Muscle Tests Before Treatment" and "Muscle Tests After Treatment," are intended to be used also for "Muscle Tests Without Correction" and "Muscle Tests With Correction." Inasmuch as both types of data may be recorded, we can distinguish them apart, by placing a small dot (.) beside the one or the other. This is one example, by the way, of making use of symbols to advantage.

Under "Maximum Duction Tests," which denotes the actual prismatic treatment administered, we find three types of stimulation—that, employing the "red glass disk," the "spot only," and the "letters." The first form is particularly efficacious in harrassing and stimulating the fusion centers. The second offers a general stimulation without holding in abeyance the accommodative-convergence, while the third is directed at the fusion impulses, holding more or less in check accommodative-convergence. All forms may be used to advantage in prismatic work. They also serve somewhat as a mutual check or as comparative data.

The first verticle rows to the left under the muscle tests and the duction tests, are reserved for the muscle balance and duction powers usually recorded whether muscular treatment is indicated or otherwise. Some times two or three such rows are employed for tests to be made on different days for corroborative purposes. The remaining rows however, are never utilized except to record the altered balances or duction powers actually determined under prismatic treatment.

The near muscle tests and near duction tests are quite as valuable as the corresponding distance tests. The fact is, that they are indispensable in many instances to a correct determination of the muscular state. **They should never be omitted**—the muscle tests, particularly. In treating muscular defect among presbyopes, more headway is often made in the near exercises than those at six meters.

Many of the other features of this card are self-explanatory. After acquainting himself with the general outline of the card and the system for recording prismatic treatments, the practitioner should find it convenient as well as practical.

MUSCLE TREATMENT

H. B. Kollofski, Opt. D.

St. Paul, Minn.

There are two distinct kinds of eyestrain. One is intra-ocular. The other has to do with the degree of tonicity and balance of the extrinsic ocular muscles, and almost as much asthenopia can be caused by an abnormal condition of the extrinsic muscle as by intra-ocular strain.

It is true that a goodly number of optometrists are placing the proper emphasis on comfortable single binocular vision along with their correction of refractive errors. Many of them are giving, under their own personal supervision, the exercises or treatments that will tone up and balance the extrinsic ocular muscles in such a way as to relieve all asthenopic conditions.

But the proportion of optometrists who are giving these treatments is altogether too small. Too many patients are leaving the offices of refractionists with an excellent refractive correction only later to be disgusted with the results. These patients will have their dull headaches, their ocular pains, their nausea and possibly many other distressing conditions.

Determined study and persistent practical experience will satisfy any thoroughgoing optometrist that 99 per cent of such cases can be given relief—and that, too, right in their own offices.

The time is coming when every optometrist will have his daily schedule of treatment cases. Those who persist in remaining merely refractionists will unquestionably fall by the wayside. We cannot stand still. We must progress or lose out. There should be no question in the mind of any real, honest-to-goodness optometrist as to the merit of muscle treatment and the success one can attain in this branch of optometry.

The following are brief descriptions of a few muscle treatment cases that have come under my observation, showing the rapid relief from distressing symptoms.

Case A—Symptoms, eyes tire, ache and "feel sandy." Patient nervous. Although wearing glasses, did not get relief. Doing a great deal of close work. O.D. plus 1.25 sph. on a plus .25 cyl. ax. 90. O.S. plus 1.25 sph. on a plus .50 cyl. ax. 90. Very little change from old prescription. Tonicity normal. Distance abduction 6 degrees and adduction 18 degrees. I developed adduction to 50 degrees. All symptoms passed away.

Case B—Symptoms, generally asthenopic. O.D. plus 1.00 sph. on a plus .25 cyl. ax. 90. O.S. plus 1.00 sph. Add plus 1.00 for close work. Abduction 4 degrees and adduction 8 degrees. Patient had some relief with glasses for a short time. She could not enjoy an auto ride or ride on a street car. Although wearing Crooks lenses, light still bothered her. Gave muscle treatment. Developed both adductor and abductor muscles. Symptoms complained of above passed away and patient is now wearing white lenses with comfort.

Case C—Symptoms, severe headaches, nervousness and heart trouble. Age 40. Wearing glasses many years. Her old prescription was "plus on minus" compounds with prisms base in and down. Adduction 22 degrees negative and 10 degrees of sursumduction. In this case I also found a slight change in refraction. Gave treatment and patient responded rapidly. Today she is wearing her prescription with no prism base in and with but one degree base down in left eye. Patient has no headaches, and states that her heart is not bothering her. Could not do close work for several years and today a reasonable amount of close work does not affect her. Is still taking treatment for hyperphoric condition.

NOTES, CASES AND INSTRUMENTS

VISUAL EFFICIENCY

Scott Sterling
Rochester, N. Y.

I was very much interested in reading the article on Chapman's Table for Visual Efficiency,* and in your editorial comments on that paper.

The investigations carried out by Chapman, Gradle, Holt, Snell, and others have not been made with the idea of upsetting the Snellen acuity notations, or of casting doubts upon the scientific accuracy of the Snellen method. These investigations are necessary because some just and accurate basis for evaluating partial losses of vision must be found.

Nearly all students of visual economics are agreed that the Snellen acuity notations, when reduced to decimals, or when considered as common fractions, do not represent corresponding percentages of useful vision. It is entirely wrong to assume that 20/30 represents a loss of 1/3 of the useful vision of an eye, simply because 20/30 is equivalent to 2/3, and 2/3 from the whole is equal to 1/3. 20/30 "visual acuity" is not equivalent

RELATION BETWEEN VISUAL ACUITY AND VISUAL EFFICIENCY

By Scott Sterling and A. C. Snell

Snellen Notation	Visual Angle in Minutes	Visual Efficiency in Per Cent	Percentage Loss of Vision
20/20	1.0	100.0	0
20/25	1.25	95.6	4.4
20/30	1.50	91.4	8.6
20/40	2	83.6	16.4
20/50	2.5	76.5	23.5
20/60	3	69.9	30.1
20/70	3.5	63.8	36.2
20/80	4	58.5	41.5
20/90	4.5	53.4	46.4
20/100	5	48.9	51.1
20/120	6	40.9	59.1
20/140	7	34.2	65.8
20/160	8	28.6	71.4
20/180	9	23.9	76.1
20/200	10	20.0	80.0
20/220	11	16.7	83.3
20/240	12	14.0	86.0
20/260	13	11.7	87.3
20/280	14	9.8	90.2
20/300	15	8.2	91.8
20/340	17	5.7	94.3
20/380	19	4.0	96.0
20/400	20	3.3	96.7
20/500	25	1.1	98.9
20/600	30	0.6	99.4
20/800	40	0.1	99.9

The visual efficiency of an eye is defined as the ratio of its resolving power to the resolving power of the normal eye.

Figure 1

to 2/3 "vision," or 1/3 "loss of vision." "Acuity" percentages are not percentages of useful sight.

Chapman's Table is open to objections because it does not make any allowance for the difference between high and low acuities, and so does not give an accurate picture of the true visual efficiency values indicated. There is a very marked difference between the visual efficiency represented by 20/20 and 20/40; but the difference in usefulness between 20/200, and 20/220, is very slight indeed; yet Chapman rates them both as representing a loss of 10% in visual efficiency.

Our own "Visual Efficiency" table (Figure 1) is based on the resolving power of the eye; on a consideration of Weber's and of Fechner's laws; of Lambert's law of light absorption and light loss; and on a whole series of experiments performed by Dr. Snell and myself. The theoretical considerations and the practical measurements showed a remarkable agreement. In several of these experiments we used the Clason Visual Acuity Meter.

Our visual efficiency table has already been presented before the American Ophthalmological Society at its meeting in Washington. It also constitutes a part of the report of the Committee on Estimating Compensation for Eye Injuries of the American Medical Association, which will be brought up for adoption at Atlantic City this month; and it is to be presented by Dr. Snell to the International Association of Ophthalmologists in London this summer.

*Chapman on Visual Efficiency, by Guy L. Du Plessis. The Northwest Journal of Optometry, Vol. 2, No. 4, pp. 105-106.

MOTORISTS REFRACTION

F. McFadden, D. O. S., F. A. A. O.
Athol, Mass.

Additional Technic for motor refraction.* I was somewhat censured for the writing of that article, yet I still believe my views were correct. To my mind the average optometrist, when called upon to advise the acuity and other visual fitness of the average man who may be his client, his neighbor, or is a possible client, or relative of a client - - - can scarcely be the right man to turn in an adverse report. If he is strictly conscientious and honest he will lose clientele, and if he is the other thing he can perhaps gain a certain sort of renown as a safe "fixer." Above all else is the fact that our methods of examination for the correction of vision take into account the wholehearted assistance of the client, but if the examinee is of the other turn of mind our present methods are wrong. In a nut-shell, the examiner for motorists is a part of the police system of the state. As such he should not examine among home folk - - - unless his salary is sufficient to remove him from hope of personal gain. Unless this is the case he will do the cause more injury, his colleagues more injustice, and himself more harm, than any possible good which could come about.

It is my opinion that optometrists should be assigned to examine motorists in districts remote from their homes, and never in their own localities. It is so easy to shade reports, and to otherwise give undue advantages that no examiner should have it in his power to accomplish these things. Indeed he will often find himself under an undue pressure, unless he is among strangers where he has no possible ulterior motive or pressure.

And above all this, our ordinary technic is at present wholly out of line with motor testing. It is our hope to be able to indicate proper methods in this work in an early issue of this Journal. As you are aware, a Committee was arranged for, at the last conference of state highway departments called by Hoover in Washington on December last. The appointments on that body have all been made, and are as follows: Dr. Howard C. Doane, Boston; Dr. Frederick Hamilton, Providence; Professor Frederick Woll, Columbia University, New York City; Dr. Herbert C. Watts, Syracuse, President, and myself as Secretary. This body is to be known as the National Advisory Commission on Vision of Motor Drivers. The name is long, but our purse is short - - - yet. As soon as a little money is available we expect to get into touch with the heads of the highway departments of each of the States, with city safety societies,

with all the optometrical societies, and to gain all the available information which has been collected in widely separated sections, to tabulate them, and to disseminate the information where needed. The secretary has reports from Maryland, New York, Boston, Rhode Island, England, and other places.

When the heads of highway departments meet in Washington again in December we expect to be able to present much definite information, and to make certain recommendations. This will work to the advantage of Optometry. But it hinges very largely upon assistance from the A. O. A., which we have every reason to believe will be forthcoming.

*Additional Technic and Procedure Required for Optometry to Give Best Service in Ocular Examinations of Motorists. Optical Journal and Review, Vol. LV, No. 8, pp. 29-31, also abstracted in the Northwest Journal of Optometry, Vol. 2, No. 5, p. 137.

A CASE OF SUBNORMAL ACUITY?

L. L. DeMars, Opt. D., F.A.A.O.
Minneapolis, Minn.

Patient, Miss L. B. Seven years of age. Sent home from school several times because of defective vision. Complains of headaches once in a while and her eyes watering when she tries to read. Mother has no trouble with her eyes, while the father, whom I do not know, has had a lot of trouble in getting glasses to suit. This little patient's vision without glasses is O.D. 15/40. It is O.S. 15/50 minus and O.U. 15/50 plus. Ophthalmoscopy showed a normal fundus through large pupils. The pupillary reaction to light was quick and the pupils became very small. Static skiametry gave O.D. + 2.25 cyl. axis 90 and O. S. + 1.50 cyl. axis 90. Vision with these was no better than without. The little girl was so small, so excited and scared that it seemed best to defer some of the other tests until she had more confidence that we were not going to hurt her and was better acquainted with the examiner. Later, extremely careful and patient fogging brought vision to O.U. 15/30 with a + 1.25 cyl. axis 90 over each eye. I have given her O.U. + 1.00 cyl. axis 90, which gives her equally good vision. These, I believe, will give her relief from her headaches and free her from the epiphoria and in six months' time her vision will have improved to normal and she will take the stronger cylinders. The question which the data of this case elicits is, is the vision subnormal because of a possible existent cramp in the ciliaries or because of a lack in the education of the vision centers as to what normal vision is, caused by the uncorrected congenital astigmia? Personally I am inclined to lean towards the latter diagnosis.

SPECIAL REPORT

VISUAL WORK IN INDUSTRY

Being a Digest of the optometric and ophthalmic literature on this subject for the year 1924, as taken from the lists of papers on Industrial Eye Work, in the CURRENT LITERATURE department appearing monthly in the Northwest Journal of Optometry. This is the third and final digest on this subject. The first digest reviewed the 1924 literature on Visual Work in Schools. The second, in three portions reviewed the literature on Visual Clinics.

C. C. Koch, Opt. D., F.A.A.O.
Minneapolis, Minnesota

Visual Fatigue

Earl J. Dean, working among weavers in the textile industries, found most visual fatigue due to improper illumination, and by correcting the existing refractive defect and regulating the brilliancy of the luminant he was able to remove most of the distressing symptoms, such as headaches and a mild form of conjunctivitus. **Hardy** adds that in many occupations visual fatigue is caused by the endless number of delicate readjustments necessary for constant fixation, inspectors, proof-readers and others doing similar work being the chief sufferers. **Meyer** describes some of the symptoms complained of by patients suffering from retinal fatigue due to improper illumination. These symptoms usually consist of, a sandy, scratchy feeling in the conjunctiva; dry, hot, burning, itching sensations; increased frequency of winking; lacrimination; difficulty in keeping the eyes open; tired, aching feelings in the eyes and in the orbits and extending to other parts of the head; blurred and indistinct vision improved by rubbing the eyes and resting a short time, but quickly returning.

Visual Pathology

Sattler reports that among the poorer working classes in Koenigsberg, the number of intoxication amblyopias in 1922 rose to six times that before the war. Sattler examined fifty-seven patients with regard to the amount and mode of tobacco and alcohol used. While formerly the amblyopia often was caused by smoking cigars, the present intoxications were almost exclusively due to the cheaper smoking of pipes. The causes were the increased use of self-grown, simple dried, not cured tobacco, and thus especially rich in nicotin, in pipes and in chewing. The unhygienic way of smoking increased the drinking of fuel spirits with its contents of methyl alcohol.

Marshutz describes the term "Klieg Eyes" as a form of ocular pathology, experienced by motion picture people, which is becoming more and more prevalent as the illumination in the studios is increased.

Kliegs, as the ailment is commonly called, brings severe suffering, its manifestations being described in a general way as similar to symptoms of electric ophthalmia, snow-blindness, etc. Violent attacks of conjunctivitis, retinitis and cyclits are common. The victim suffers ocular pain and a feeling as if "sand were in the eyes." Quite similar suffering must be endured by those who become afflicted with catarrhal conjunctivitis, though Klieg eyes, greatly magnifies the annoyance. Often nocturnal excretions completely close the palpebral fissures. Klieg eyes is a pathological condition, but not a germinal infection, it being due to external invisible causes, that seem to affect vision. The theory is that the large amount of ultira-violet rays in the Klieg arc-light is responsible.

Illumination

Sheard finds there are three essentials to good illumination, irrespective of whether this illumination be used in office, factory, home or public building. These essentials are: (1) The illumination must be sufficient to enable objects to be seen clearly enough for the purpose in hand; (2) the illumination must be reasonably steady; that is, an avoidance of flicker; (3) there must be a proper relative distribution of brightness within the field of vision, or glare in its various forms must be avoided. **Roy S. Dean** describes types of electric units to be used in various industries to give proper light diffusion and to enable workers to carry on with greatest comfort and efficiency. He further believes that a more scientific use should be made of natural illumination which he claims can be properly regulated in any factory by the correct

use of shades and reflectors. **Earl J. Dean** found in the textile industry, many of the workers using lights of too high a power and by reducing the candle-power and rearranging the lighting unit, much discomfort was avoided without impairing the quality of the work.

Protection Glasses

Friedenwald discusses a type of protection glass, which under a severe blow would crack but never shatter. This is of course an advantage in industrial work, as it eliminates all danger for flying particles of glass should the protection glass be broken. **Culverhouse** advises the use of a tinted lens for the employees of power houses, while **Earl J. Dean** finds that when the illumination is proper and the refractive correction in place there is, in the otherwise normal eye, no need for a tinted lens among industrial workers. **Sheard** advises the use of a suitable protection glass when the worker is obliged to work under conditions supplying more ultra-violet or more infra-red than found in daylight.

Injuries

Snell finds that the essential or indispensable elements of vision are (1) perception (visual acuity), (2) allocation (field function), and (3) muscular movements. Among the non-essential functions he finds color perception, depth perception, orientation, adaptation to light and dark, fusion sense, etc.

In considering each of the three indispensable elements of vision Snell finds that in an economic sense not only is each of these elements essential to normal visual function, but also that the action of each is co-ordinate and reciprocal. However, it cannot be said that each of these three factors is of equal importance, for we all know that visual perception (or visual acuity) is by far the most important. How, then, may we compute the numerical value of these separate elements which compose the complete act of vision, which shall satisfy these conditions? We find that by the law of the relation of indispensable co-ordinating elements of complex organisms these elements stand in the relationship to one another as do the factors in a product, and, undamaged, they are each of unit value. If any element is more important than another, such an element may be given a root value since by so doing its partial loss has less influence on the total product, which is the thing desired; but this mathematical treatment does not alter the relation of these elements as factors of a product, nor does it conflict with our premise that the product of the combined essential factors is one (1) or 100 per cent, because the square root of one is one. Neither does it conflict with the premise that the product is 0 when any element is lost, since the square root of 0 is 0. Therefore, field function may be given a root value, since it is less important than acuity.

For the purpose of brevity and clarity, let "P" represent perception (acuity of vision), "A" allocation (field), and "M" muscle function, and let "F" represent full vision. Then the formula for full vision would be

$$P \times \sqrt{\ } A \times M = F.$$

And, since the coefficient of each element for full normal vision must be one in order to obtain a 100 per cent product, and since the $\sqrt{1}$ is 1, then our numerical formula for complete normal vision is

$1P \times \sqrt{\ } 1A \times 1M = 1F$, or 100% vision.

When there has been total loss to one or more factors, the formula for expressing the amount of vision would be for total loss of any one factor, as follows:

For perception .....$F = 0 \times 1 \times 1 = 0$
For allocation .....$F = 1 \times 0 \times 1 = 0$
For muscle function ...$F = 1 \times 1 \times 0 = 0$

The loss of two elements would, of course, give an 0 product. These formulae, then, completely satisfy our premise in this respect—that the total loss of any indispensable factor causes a total loss of function.

Having established the numerical value of each factor and their relationship to one another for no loss and for total loss of one or more, the next step in our problem is to determine the percentage of functional loss when there occurs a partial loss to one or more of these essential functions of vision. Snell determines this percentage in the following manner:

Coefficient of Factor M—The value of the muscle function may be determined in a practical way. In the first place, it must be admitted that any paralysis which causes a constant irremediable diplopia causes the com-

plete loss of use of all the functions of one eye. It is so regarded by the Compensation Law of New York State. From a practical point of view most of the cases of muscle disturbance, due to industrial injury or disease, are either curable or incurable, the latter usually causing irremediable diplopia and the loss of binocular single vision. When this occurs, it should be regarded, as it is in New York State, as having the same value as that for the loss of one eye. In other cases the amount of functional loss and the coefficient for partial diplopia may be estimated in proportion to the area of the motor field in which diplopia is persistent, considering also the usefulness of that part of the motor field. Diplopia in the lower half of the motor field is just as serious as is a complete diplopia, whereas diplopia in the upper motor field disturbs visual working ability only slightly. In general, a permanent paralysis of any single extrinsic ocular muscle causes diplopia in one-half of the motor field. Thus in these cases the coefficient of factor M would be .50 (.50 M).

Coefficient of Factor A—The numerical independent value for partial loss of field vision is determined by the amount or degree of concentric contraction. This concentric contraction may be anywhere between the 65 degree meridian (no loss) and the 5 degree meridian (total loss of field). The co-ordinate factor value of field is the square root of this fraction, which is the coefficient of factor A, allocation. The percentage of field function remaining after various degrees of contraction and the square root of this quantity is shown below:

Table I. Showing the Coefficient Value of Factor A (Field)

Contraction to	Per Cent of Normal Field	Coefficient of A
65° = 100,	square foot of	= 1.00
60° = 92,	" " "	= .96
55° = 83,	" " "	= .91
50° = 72,	" " "	= .86
45° = 67,	" " "	= .81
40° = 59,	" " "	= .76
35° = 50,	" " "	= .71
30° = 42,	" " "	= .65
25° = 33,	" " "	= .58
20° = 25,	" " "	= .50
15° = 16,	" " "	= .40
10° = 8,	" " "	= .28
5° = 0,	" " "	= .00

This method of assigning a root value to the field function does not violate the premises previously laid down by Snell, to-wit: that no loss to field produces no loss to total function and that a total loss to it produces a total loss to visual function, because as previously stated, the square root of 1 is 1, and the square root of 0 is 0. We find further that by giving to the field a root value, there will be for the slight disturbance of field only a slight loss to total visual function, and for the more serious losses there will be a greater proportionate loss to function, which is in exact harmony with what actually happens when there is a partial loss to field.

Coefficient of Factor P—Snell finds that the consideration of a mathematically correct method for the measurement of visual perception and partial loss thereto should have our careful attention, since there is still a divergence of opinion in regard to the correct mathematical interpretation of the accepted Snellen standard of measurement for the different degrees of visual acuity. This is the most important phase of our problem. In the United States the Snellen 5 min. angle or 20/20 letter has been accepted as the standard of normal visual acuity, and we find that there is an almost universal agreement on accepting 20/220 extremes as standards, how may we correctly determine in a mathematical way the utility value of the various degrees of visual perception or acuity?

Snell believes the proportionate value of the different degrees of visual acuity is best and most accurately determined when it is based on the accepted and approved Snellen letters or characters, constructed and used in geometrical progression, regarding each step in the graduation as having equal value. His reasons for this conviction are:

1st—Test letters constructed in geometrical progression have been in practical use by refractionists throughout the world for more than 50 years, optotypes so constructed having received the stamp of approval of many scientific societies.

2nd—The proportionate value of acuity of vision based on tests made with test letters constructed in geometrical progression preserves throughout the series the fundamental principle laid down by Snellen, that the value of

the acuity of vision is the reciprocal of the smallest visual angle formed by the test-object measured by comparing the distance at which the letters are just seen with the distance at which they subtend angle of five minutes, the comparison being carried out in complete sequence throughout the entire range of vision. In the geometrical series the interval between any two series of test letters is constant so that acuity is always measured by the same ratio of increase, whether it be between the first and second test letters or between the tenth and eleventh or any other two.

In the geometrical ratio vision is always proportionate to the relative size of the visual angle and all ratios are equal, 20/30: 20/60=20/120: 20/240, etc. For example, the 20/60 letter is twice as large as the 20/30, and the 20/120 letter is twice as large as the 20/60, and 20/240 is twice as large as the 20/120. Therefore the percentage of visual acuity between these points is the same. Note that between 20/120 acuity falls, 30 per cent, and between 20/120 and 20/240 it falls 30 per cent.

That is, visual acuity falls in direct proportion to the relative size of the visual angle or size of the test character, which principle is consistent with Snell's fundamental concept, that vision falls in acuity proportionately with the size of the visible image. Constructing a graph on the principle of geometrical progression, considering each gradation of equal fractional value, and basing the percentage on the principle that visual acuity is in inverse proportion to the size of the retinal image, Snell finds that the line which represents the decrease or fall in visual acuity is a symmetrical curve and not a straight line, that such a curve falls uniformly, and that it represents vision, when it approaches the degree of blindness, as falling gradually to 20/450 or beyond, depicting a state of affairs as they actually exist. He further claims that any conception or graph which considers or represents visual acuity as falling in a straight line and becoming nil suddenly, for example at 20/220, or at 20/350, or at 20/450, etc., does not represent the true behavior of falling vision.

The mathematical values for the different degrees of visual acuity computed in accordance with the above principles are shown in the following table. These percentages are the coefficients for factor P in Snell's formula for determining the utility of the complete act of vision.

Table II. Showing the Corresponding Fractional Value of the Snellen Expression, Based on Equal Gradations from 20/30 to 20/300.

Snellen Expression	Fractional Value	Percentage and Coefficient for P
20/20	10/10	100
20/30	9.5/10	95
20/40	9/10	90
20/50	8/10	80
20/60	7/10	70
20/75	6/10	60
20/100	5/10	50
20/120	4/10	40
20/150	3/10	30
20/200	2/10	20
20/240	1/10	10
20/300	0/10	0

Thus, when there is a partial loss to one or more of the essential factors of vision—muscle function, field, or visual acuity—the coefficient for each may be determined separately and the total value of full visual function is the product obtained by multiplying all of these coefficients together, and this product in turn becomes the coefficient of factor F in the formula representing earning ability:

$$(P \times A \times M)\ F \times C = E.$$

For example, in order to determine full visual function and the coefficient of F when visual acuity alone is less than normal, assuming 20/50 Snellen, no disturbance of muscle or of field, we find that 20/50 Snellen is 80 per cent of standard visual acuity, so .80 is the coefficient of P, and the coefficients of A and of M are 1, these factors being normal. Therefore, by multiplying together these coefficients we have the formula for full vision, $.80 \times 1 \times 1 = .80$ or 80 per cent visual function, and this becomes the coefficient of F. If at the same time that visual acuity is 20/50, the field were contracted to 35 degrees, by consulting the table we find that for this degree of contraction, the coefficient of factor A is .71, then for full vision we have the formula, $.80 \times 71 \times 1 = .568$ or 57 per cent visual function, this being the coefficient for factor F. And should there be in addition to these disturbances a

paralysis of one ocular muscle, the coefficient of M would be .50 and our formula would be: .80P×.71A×.50M =.284, or 28 per cent vision.

Refraction of Industrial Workers

Petry points out the difference of lens effectivity of a distance correction when used at the near point and cautions refractionists to make allowances for this difference in prescribing for workers. **Dublin** suggests the following routine for "plant" refractions: Ophthalmoscopy, Skiametry (Static and Dynamic) and Accommodative, Tonicity and Duction Tests. These refractions being of a survey nature only. **Shepard** describes the particular focal points needed for workers in the following trades and professions: The Butcher, the Grocer, the Druggist, the Salesperson (with reference to color matching), the Bookkeeper, and the Draughtsman.

Visual Surveys in Industry

Roy S. Dean writes that in making visual surveys in industrial organizations the following factors are involved: Ocular Pathology, Malnutrition, Refractive Defects, Posture, General Working Conditions, Safety of Workers, and Illumination. Regarding the latter, the refractionist must take into consideration the natural and artificial lights, with regard to the amount of light, its diffusion, color, quality, shadows and glares, the vertical surface illumination and general maintenance. **De Santes** suggests that optometric organizations establish refractive teams to do ocular survey work in factories. These teams to merely check the visual acuity of each worker, reporting the findings to the plant superintendent and to the employee.

Visual Defects in Industry

Boatman in making a survey of employees in a paper mill near London found 74 workers out of the 151 employed with such defective vision as to make the use of corrective lenses imperative. **Simpson** estimates that at least 25,000,000 workers in America have subnormal vision. **Swadon** gives the following figures:

One of the largest engineering firms in the world, employing over 65,000 workers, recently had the question of the eyesight of their employees under consideration and over 60,000 were examined. Of those, 31,000 were found to have normal vision, and 29,000 defective vision. There were 207 who were blind in one eye. The firm was the Ford Motor Co. In an examination of the workers in a textile factory, employing over 2,000 hands, those wearing glasses that were satisfactory were 9.7 per cent, those who needed their glasses changed 16.9 per cent, those who required glasses 46.8 per cent, those not needing glasses 22.1 per cent, and perfect sight 4.5 per cent.

While **Roy S. Dean** draws the following conclusions based on years of industrial eye work:

1. The emmetropic or normal eye is practically unknown in industrial employees, 98 per cent showing an error of refraction or eyestrain condition, 40 per cent of these employees have visual defects which interfere with their work.

2. Production shows an increase of from 12 to 20 per cent by the proper diffusion of illumination and the increasing of vision.

3. Industrial lighting maintenance cost can be reduced one-fourth by the proper diffusing of the natural illumination.

4. The "Safety First" slogan, for action in industry, is dependent on good vision and good illumination.

5. Statistics show that in one woodworking industry, every serious cutting accident since 1920 was in an employee with a loss of more than 20 per cent in vision.

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ABSTRACT DEPARTMENT

Optometric and ophthalmic journal articles and reprints to be abstracted should be sent to the editor. Only papers on subjects of interest to optometrists will be reviewed in this department.

Barr, F. P. Color Vision and Color Blindness. The North Carolina Optometrist, Vol. 1, No. 7, p. 5, 1925.

Barr, following an extended period of color vision study, comes to the following conclusions regarding the color-blind:

"1. Most color-blind make mistakes with certain colors, but are correct with regard to others.

"2. The color-blind name colors in accordance with their color-perception, and thus show definitely to which class they belong.

"3. Colors may be changed to the color-blind, whilst leaving them unaltered to the normal-sighted.

"4. The phenomena of simultaneous and successive contrast are much more marked for the color-blind than for the normal sighted.

"5. Many color-blind match correctly, but name the principal colors wrongly.

"6. Many color-blind recognize colors easily when they are close to them, or the surface is large, but fail to distinguish between them when they are at a distance or the image on the retina is small.

"7. The color-blind are more dependent upon luminosity than the normal sighted, and are liable to mistake a change in luminosity for a change in color.

"8. The color-blind find special difficulty with faint and dim colors.

"9. The color-blind who have shortening of the red end of the spectrum cannot see reds reflecting or transmitting only rays corresponding to the shortened portion.

"10. The color-blind find more difficulty in comparing colors when different materials are used, than when the colored objects are all of the same nature.

"11. Most color-blind find more difficulty with transmitted than with reflected light.

"12. The color-blind have a defective memory for colors.

"13. Colors may be changed to the normal-sighted whilst leaving them unchanged to the color-blind.

"14. The color-blind may have a sense of luminosity similar to that of the normal-sighted.

"15. Color-blindness is frequently associated with very high intelligence, and exceptional ability." T. O. B.

Chaffee, E. L., Bovie, W. T., and Hampson, Alice. The Electrical Response of the Retina Under Stimulation by Light. American Journal of Physiological Optics, April, 1925.

A brief historical review of work previously done and a good description of the apparatus employed is given in this article. The writers have obtained sets of curves giving general characteristics and proving that under the influence of light, an electrical current measurable in micro-volts is set up by the retina and transmitted to the brain.

The apparatus employed is ingenious and briefly consists of three units: (1) is an eye chamber and a source of light regulated in its intensity and duration, affecting the posterior half of a dissected frog's eyeball to which are connected two electrodes, one to the retina, the other to the nerve; (2) is a thermionic resistance coupled amplifier to increase the response without drawing energy from the retina; (3) consists of a galvanometer and photographing device. The negatives obtained are interesting in that they give a curve where the current set up is plotted against time, thus showing the actual rise and fall of current under the influence of various factors. The article concludes with a set of tables and photographs of the instruments. G. L. DuP.

Cobb, Percy W. The Meaning of "Speed of Vision." Transactions of Illuminating Engineering Society, Vol. XX, No. 3, pp. 253-269, 1925.

In recent factory tests Cobb shows that an improvement in the lighting and an increase in the illumination resulted in greater productive effectiveness of work. This paper is an analysis of the process. To arrive at the conclusions Cobb found it necessary to evaluate the actual factory output over suitable periods. He found that 20 f. c. with judicious distribution of light increased production by 12.5% over 5 f. c. at a cost to but 2.4% of the pay roll. The study of increase in factory output, Cobb states, does not rest alone with illumination but also with the time available for the building-up of an effective retinal impression. Vision is critical in human activity for a part only of the whole time. This may be a small or a large fraction. Cobb says that the degree to which vision is taxed during this fraction is various, depending upon: The size of the objects worked on, the contrast in which seen and the general brightness due to illumination. Losses and accidents due to deficient or poorly distributed light are referable not only to a complete inability to see but may also result from a delay in the building up of an effective impression on the retina. In case, Cobb states, the visual object is not adequate in brightness, contrast, etc., to produce an effective impression within the duration of the eye-stop the result is not diminished vision but complete failure to see. Elimination of such failures of vision can be brought about by practice and habituation in slower rythm of eye movement, at the expense of certain amount of time which might or might not be practically negligible. This attempt on the part of the organism to eliminate failures may be partially successful, Cobb states, resulting in false movements of the eyes and of other parts of the body with consequent loss of time and wear and tear on the eyes and the nervous system. E. O. F.

Ferree, C. E. A Spectrum Color-Mixer, an Acuity Apparatus and an Apparatus for Testing Astigmatism. Psychological Bulletin, Vol. 22, No. 2, p. 94, 1925.

Ferree, in a short announcement, offers, what he terms, a new apparatus for subjective testing. The color-mixer is an attachment to the ordinary spectroscope, by means of which two-color, three-color or four-color mixing may be made. The energy values of light may be measured, he states, by permitting quantitive comparisons of relative sensitivities. The acuity apparatus is such that the acuity object is evenly illuminated, may be varied for high

and low intensities and the visual angle of the test object may be varied over a wide range in finely graded amounts. Light and color senses may be tested and the apparatus may also be used as a mixer of filter colored lights. The astigmatic feature is the quick and precise determination in terms of alignment and not in sharpness or clearness. E. O. F.

Lebensohn, Jas. E. The History of Spectacles. Hygeia, Vol. 3, No. 5, pp. 253-255, 1925.

This is a short history of spectacles for the laymen. Lebensohn tells of the Chinese holding glasses in superstitious reverence as a symbol of good luck. The frames were made of tortoise shell, from a sacred animal, and the lenses were of lucky stones, such as rock crystal, topaz and amethyst found in the sacred mountains. In China inferiors were required to doff their glasses when before their superiors. Lebensohn tells of glasses being opposed by the clergy and physicians. The clergy believed that glasses defeated the divine purpose of inflicting disabilities upon the aged. The physicians' opposition was on the grounds that spectacles averted faith in their eye lotions. The history of spectacles is vague during the Middle Ages. A picture of Saint Jerome painted in 1480 is believed to be the earliest painting showing eye glasses. St. Jerome was the patron saint of the early spectacle-makers' guilds. Coins, dated 1589, show spectacles stamped on them as a symbol of better sight. The early spectacles, Lebensohn states, were advertised as allowing free breathing. E. O. F.

F. I. O. The Treatment of Partial Amblyopia. The Refractionist (British), Vol. 14, No. 169, p. 117, 1925.

In treating partial amblyopia the better eye should be occluded, so that the other has to be visually active, or the better eye might have its visual acuity reduced by a smoke coloured glass placed in front of it. At first the exercise should be confined to distant vision for periods commencing with a few minutes and gradually extended to say an hour, two or three times a day. This should be followed by reading exercises, the type selected being the smallest legible, the corrective lenses being used, and with the better eye occluded. The reading exercise, commencing with a few minutes a day, should be gradually increased in time and frequency, also the size of type employed should be gradually reduced. The eye might also be exercised in occupations such as drawing and writing.

When the defective eye is able to read reasonably small type, it should be further exercised in company with the better eye. The most simple procedure, for this purpose, is to place a rod, of about an inch in thickness, a few inches in front of the eyes, midway between them, and between the eyes and the printed matter. If all the print, in each line of type, is to be read both eyes must be used simultaneously. This exercise not only forces the defective eye to be used, but also promotes binocular vision with simultaneous employment of the two eyes. T. O. B.

Jackson, E. The Diagnosis of Blindness. (Charts), 1925, Papers to be Presented to the Section on Ophthalmology of the A. M. A., in Session at Atlantic City, pp. 235-269, 1925.

Jackson reviews 704 cases of blindness or near blindness. These cases are divided in a general way as follows; lens opacities, corneal opacities, vitreous opacities, detachment of the retina, glaucoma, atrophy of the optic nerve, retinal disease, choroidal disease, panophthalmites and shrunken globe, retrobulbar neuritis, tobacco amblyopia, diseases of the visual tracts and congenital amblyopia, with or without squint, and the author finds that in making a diagnosis of blindness he was able to, in all but the last class mentioned (congenital amblyopia), verify the absence or near absence of vision by certain objective symptoms or changes which enabled him to closely estimate the exact status of the remaining visual acuity, if any. T. O. B.

Lloyd, R. I. Field Study: When and Why? The American Journal of Physiological Optics, Vol. VI, No. 2, pp. 129-140, 1925.

"Any case that cannot read 20/20 test type, and for which the cause of

the departure from normal is not found in the refraction, or in the cornea, lens or vitreous, is a probable candidate for field examination," says Lloyd in a plea for a more universal use of the perimeter and campimeter. The whole message is of course aimed at the ophthalmologist with the customary disregard for the optometrist (although it has been frequently said that 2/3 of the campimeters in existence are in the hands of the later group), nevertheless the message has an equal significance for optometrists and coming from this student of retinal defects should be of value in stimulating optometrists to make careful surveys of the field whenever any possible question could arise as to the condition of this most important ocular area.

T. O. B.

Luckiesh, M., Holladay, L. L. Glare and Visibility. (Ill.) Transactions of Illuminating Engineering Society, Vol. XX, No. 3, pp. 221-252, 1925.

The writers admit that they have entered a complex and indefinite field and one which is difficult of solution. Glare has a decided effect on visibility, the actual diminishment of which Luckiesh and Holladay did not attempt in this article. They divided glare and visibility into seven phases, as follows:

Veiling glare. That which is produced by light more or less uniformly superimposed on retinal images, thus reducing contrasts and hence visibility. This type of glare is best demonstrated by the illumination from fog or smoke.

Dazzle glare. This type is the most common according to the authors and is produced by any light entering the eye which does not aid vision. It reduces visibility and may be barely noticeable, distracting, discomforting or painful. The authors offer as an example any light source in the visual field which is annoying to the observer.

Blinding glare. This has been defined as the highest degree of glare and is due to retinal images of extreme brightness which reduce for a time the ability of the retina to respond normally to light. The authors suggested the term of scotomatic glare as better suited to the type.

Irradiation is a product of glare according to the authors, who define this type as the apparent increase in the size of an object which is brighter than its surroundings.

The growth and decay of afterimages is a phase of visibility which concerns the time for an effect of a brightness to disappear after the stimulus has been cut off. The time hereinmentioned is a variable depending, of course, on the strength of the stimulant. The psycho-physiological effects of light sources. When a light source is exposed to view, the observer notes its pleasantness, discomfort, etc., by his physical and mental experiences in general. The authors state that this is possibly due to the visual processes attempting to adapt itself to the stimulus.

The size of the pupil of the eye has its effect on visibility as it determines the amount of light entering the eye, brightness of the retinal image, effectiveness of proper lighting and the harmfulness of improper lighting. The size of the pupil varies in diameter with the brightness and the position of the light source.

E. O. F.

MacCallan, A. F. The Eyes in Hot Climates. (Abst.) The Optician (British), Vol. LXIX, No. 1775, p. 133, 1925.

MacCallan, formerly of the Egyptian Government Ophthalmic Hospitals, has found that a hot climate causes greater fatigue than a temperate one, and this fatigue may lead to fatigue-indigestion with resulting physical depression. Worry may also cause ill-health. Under these conditions, he found that trifling errors of refraction, or slight degrees of heterophoria, exerted effects quite out of proportion to their actual severity, and he emphasized the importance of careful correction of these errors, generally under a cycloplegic such as homatropine.

In a highly sensitive patient, whose nerves were constantly being jarred by physical or mental discomforts, the correction of a very small degree of astigmatism might make all the difference between happiness and misery. In a country such as Egypt, the healthy emmetropic eye of the European becomes painfully affected by the sun's glare in the summer when motoring

or riding along dusty roads or over the desert. It is the heat rays from the red end of the spectrum which cause this. To prevent the effects of glare, Mr. MacCallan advises the wearing of protective goggles; but if discomfort is complained of the refraction of the patient should be verified.

In his own experience of a large number of cases he found that ordinary glass in which was included, if necessary, a very small ametropic correction, was all that was required. Sun, dust, and wind might also cause pinguecula and pterygium. In dusty seasons it is most advisable to wash from the eyelids the dust which collects there and which may contain septic material. This should be done three times a day. In many cases he found this simple precaution sufficient to prevent constantly recurring attacks of conjunctivitis. T. O. B.

Mac Rea, W. The Technic of Refraction. Eye, Ear, Nose and Throat Monthly, Vol. IV, No. 3, pp. 153-157, 1925.

Mac Rea writing of Presbyopic additions in a paper on general refraction claims that most refractionists overcorrect for near point work. He says a +2.25 D. Sph., added to a properly fitted distance correction is all the addition ever needed, regardless of age, for reading or any near work at 33 c/m. T. O. B.

Parker, W. R. Ocular Manifestations of Diabetes. The American Journal of Ophthalmology, Vol. 8, No. 4, pp. 284-287, 1925.

Amblyopia, a paralysis of the Extrinsic Muscles, Sudden Refractive Changes, Iritis, Xanthelasma, Bilateral Cataract, Retinitis, Ophthalmic Neuritis and Retinal Lipemia may be due to diabetes says Parker who always advises a careful examination of the urine in patients having any of the foregoing visual defects. T. O. B.

Rademacher, W. H. Lighting. The Educational Program of the Optometrical Society of the City of New York, Vol. I, No. 2, pp. 1-2, 1925.

Rademacher asserts that the basic rule to follow in the placing of all luminants is to remember that they must be so placed that the source will be invisible, that the light coming from a luminant must be thoroughly diffused and well distributed; that all reflecting surfaces are not highly polished; that in indirect lighting the sidewalls and ceiling be of sufficient brightness to aid in diffusing and distributing the light that comes from the source. T. O. B.

Snell, A. C. Visual Efficiency of Various Degrees of Subnormal Visual Acuity and its Effect on Earning Ability. (Charts), 1925, Papers to be Presented to the Section on Ophthalmology of the A. M. A., in Session at Atlantic City, pp. 73-87, 1925.

Snell tabulates the visual record of 100 selected cases of defective vision with a range, in the better eye, of from 20/40 snellen to 5/200 snellen, showing the effect of this visual disturbance upon the patient's ability to work. His findings lead him to believe that the average worker can perform all familiar duties without trouble as long as his vision is at least 20/60 snellen and that a worker's visual acuity must be less than 20/60 snellen and in many cases as low as 20/100 snellen before it interferes with the worker's ability to successfully perform his duties. T. O. B.

Swain, W. Ophthalmo-Optical Research. The Optician (British), Vol. LXIX, No. 1775, pp. 114-117, 1925.

Swain finds that visual statistics taken at different portions of England, vary more than they should and this is largely due to a lack of co-operation upon the part of the refractionists making the visual surveys. He suggests the universal use of the following routine refraction and the recording of the data in the following manner:

1. Number of case.
2. Town, country or suburb.
3. Date of test.
4. Sex.
5. Age.
6. Occupation.
7. Complaint.
8. Refractionist, A, B, C, etc.
9. Pathological Notes.
10. Description of test, wearing, subjective test, static and dynamic retinoscope, keratometer, prescription.

11. Vision.
12. Sphere.
13. Cylinder.
14. Axis.
15. Vision after correcting.
16. Binocular addition.
17. Accommodation, monocular.
18. Accommodation, binocular.
19. Phoria and duction tests.
20. Prism prescribed.
21. Direction of base.
22. Pupillary distance.
23. Cross reference.

More of course could also be added but Swain suggests this as a minimum, and with complete data of this kind from various sources, centrally filed he feels that one could compile data, charts and graphs on any phase of ocular refraction and the work would stand as authoritative. T. O. B.

Refraction and the Oculist (Editorial). Eye, Ear, Nose and Throat Monthly, Vol. IV, No. 4, p. 212. 1925.

In this editorial it is forcefully pointed out that the major portion of every ophthalmologist's time is taken up with refraction and to prove this statement the following figures and data were given.

The ophthalmological group in Cleveland held a "Save Your Sight" day on January 15th of this year. Various ophthalmologists made a preliminary examination of the eyes of 1,598 persons. These perspective patients were roughly grouped into three classes as follows: First, 1,262 cases of general refraction. Second, 282 cases of eye pathology. And third, 54 cases of strabismus. The editorial also comments that, inasmuch as the large percentage of ophthalmological business was refractive, that perhaps it would be advisable for this group of refractionists to do a little more studying on the various phases of refractive technic. T. O. B.

(The large number of pathological and strabismic cases above recorded were unquestionably due to the fact that survey was advertised as a medical affair. Editor, Northwest Journal of Optometry.)

BOOK NOTICES

New Books for review should be sent to Dr. E. O. Fjelstad, Red Wing, Minnesota. Only Books of such nature as to be of interest to optometrists will be used in this department. Optometric and Ophthalmic publications that have been issued in the past and which are still procurable through their publishers will also be reviewed, from time to time, as space permits.

PRINCIPLES OF OPHTHALMOSCOPY AND SKIASCOPY. G. F. Alexander, M.B., C.M., Edinb., Newcastle, England. Buckram, 80 pp., 30 illustrations. London, J. & A. Churchill.

This book gives an algebraic demonstration of the principles of ophthalmoscopy and skiascopy, so that a certain amount of material on the subject is now contained in one volume. The first part, dealing with opthalmoscopy, has chapters on: 1, The Simple Convex Refracting System. 2, The Correction of Hyperopia and Myopia. 3, Axial Ametropia. 4, Curvature Ametropia. 5, Parallactic Movements. 6, Direct and Indirect Ophthalmoscopic Images. The second part deals with skiascopy and carries one through the study of the reflexes in the presence of and in the absence of astigmatism and spherical aberration.

E. O. F.

THE THEORY OF MODERN OPTICAL INSTRUMENTS. By **Dr. Alexander Gleichen.** Translated by **H. H. Emsley** and **W. Swain.** Second Edition (Ill.), 365 pages, 1921.

The portion of this text contains a well written review of the more important laws of refraction dealing with spherical surfaces and dealing with the formation of images by single lenses and by combinations of lenses. The second portion of the text applies these laws of refraction to modern ophthalmic instruments in a clear well written manner. This book was compiled with the student refractionist in mind and has a useful biography.

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Original papers, scientific communications and correspondence should be addressed to Editor. Books for review should be sent to Dr. E. O. Fjelstad, Red Wing, Minnesota. Reports of society proceedings in Minnesota should be sent to Dr. A. R. Burquist, in North Dakota to Dr. A. S. Anderson, and in Nebraska to Dr. A. M. Skeffington. Special Reports should be sent to Dr. A. H. Nordland. News items should be sent to Dr. H. B. Kollofski.

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JACK I. KURTZ, Room 209, Yeates Building, Minneapolis, Minnesota.

The Journal has no objection to the reprinting by other magazines of any of its articles, providing such reprints are properly credited to the Northwest Journal of Optometry

VISION OF MOTOR DRIVERS AND THE A. O. A.

Through the National Advisory Commission on Vision of Motor Drivers the American Optometric Association has a splendid chance to advance optometric thought and prestige. Here is a small group, composed of some of the best minds in optometry, working upon a problem all optometrists are interested in, and this group should be given all the financial and moral support possible by our National Association.

That the vision of motorists should be examined all agree, but the method of application is still questionable. This commission, appointed by Secretary Hoover, can and will do much to standardize this type of optometric procedure, making it acceptable to the lay public, thus placing our profession in its proper advisory sphere.

Petty jealousies, politics and sectional "wire-pulling" should be thrown into the discard at Louisville, and, during this coming meeting, the A. O. A. should get wholeheartedly behind this and similar movements and give them one hundred per cent support.

C. C. K.

A CODE OF ETHICS FOR THE OPTOMETRIC PROFESSION

The following Code of Ethics was delivered to the Cumberland and Westmoreland Optometric Associations in England by Mr. M. Strother, and because of its intrinsic merit and because it is a wholesome bit of reading for optometrists in this country, we are reproducing it in full from the **Refractionist.** Article IV has, of course, little or no application to optometrists on this side of the water inasmuch as most of us do **little** or no dispensing, but the other four articles should prove thought producers and should recall to mind similar codes now in force in our own locals.

ETHICS OF OPTOMETRY

Duty to the Profession and to the Public

Article I

1. Every Optometrist should regard it his duty to advance the profession of Optometry, and to work for the progress and recognition of the profession.

2. It should be the duty of every Optometrist to keep himself in touch with every modern development of his profession, to increase his knowledge

and efficiency by the adoption of modern methods of proved worth, and to contribute his share to the general knowledge and advancement of the profession by all means in his power.

3. The endeavor to attain the highest possible standing of personal conduct, character, and quality of professional work shall be deemed the best indications of an Optometrist's ethical relationship to his profession.

4. An Optometrist should be diligent in enlightening the public regarding the care of the sight, and dangers of defective vision. He should endeavor to raise the standard of competency among Optometrists, and do all in his power to attain and preserve legislative recognition of the practice of Optometry, and be diligent to keep it effective and beneficial.

DUTIES TO PATIENTS
Article II

1. The confidence shown by a patient placing his case in the care of an Optometrist should not, under any circumstances, be abused. All information of a private nature revealed in the course of examination should be regarded with professional secrecy, and the notes, where necessary to record, should be entered by conventional signs. He should not discuss with others the health, age, visual acuity or idiosyncrasies of his patient.

2. No exaggeration of a patient's visual defect should be made. If glasses are not necessary, the patient should be so informed, and charged the regular consultation fee.

3. It should be the aim of every Optometrist to establish and maintain high ideals of professional honor and responsibility, and to endeavor in every way to render full ocular comfort and satisfaction to his patients.

4. No guarantee, regarding results to be attained by use of spectacles prescribed, should either be expressed or implied.

5. Indigent patients unable to pay regular Optometrist's fees are recommended to special consideration.

DUTY OF OPTOMETRISTS TO EACH OTHER AND KINDRED PROFESSIONS
Article III

1. An Optometrist should avoid criticism of other Optometrists as unethical and unprofessional, but rather endeavor to justify, as far as possible, the exercise of orthodox methods by duly qualified Optometrists.

2. Consultations with other Optometrists should be arranged in cases where satisfactory results have not been obtained.

3. An Optometrist who has attended the patient of another in consultation should not himself independently advise or prescribe for the same patient without first advising the original Optometrist of his intention.

4. All suspected conditions of ocular pathology should be referred to an Oculist and his advice sought before glasses are prescribed. Also, in cases involving general health, where medical attention is deemed necessary to the satisfactory use of glasses, the co-operation of the family physician should be solicited. But the referring of such patients for medical attention on the grounds of general health without particular involvement of eye health does not necessarily mean delay in prescribing if you are of the opinion spectacles will be beneficial.

5. Optometrists should not indulge in any criticism of the medical profession, but should endeavor to co-operate and work in harmony with them.

6. It is unlawful for an Optometrist to use any titles that would create the impression he is a medical practitioner, or to prescribe drugs and medicines for diseased eyes.

DISPENSING PRESCRIPTIONS
Article IV

1. An Optometrist should pay neither fee nor commission to any Oculist for the privilege of dispensing that oculist's prescriptions.

2. When dispensing Oculist's or other prescriptions, your position as dispenser renders it unethical for you to pass any comment, whether at request of client or otherwise.

3. If the client should return with complaint that glasses dispensed to Oculists' prescriptions are unsatisfactory, your first duty is to carefully check lenses and mounting, and no fault being there discovered, the client should be advised to again consult the prescriber.

4. In the event of the client declining to return to the original prescriber, it shall be ethical for the dispenser to assume the position of prescriber.

MISCELLANEOUS

Article V

1. It is undignified and unprofessional for an Optometrist to canvas from house to house or to employ others for that purpose, but he may make professional calls by request.

2. All printed and displayed advertising of whatever form should be dignified and educational, expressed in good English, and free from all extravagance and exaggeration.

4. All reference to "Free Examination" should be strongly discountenanced as distinctly unethical and opposed to the first principle of professional Optometry.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

TWENTIETH ANNUAL CONVENTION AND POST-GRADUATE CLINIC OF THE OKLAHOMA ASSOCIATION OF OPTOMETRISTS

Oklahoma City, April 20-21-22

Monday, April 20th, was devoted entirely to business of the association. The convention was opened promptly at nine o'clock with prayer by Dr. J. R. McCrary. The address of welcome was delivered by Dr. W. S. Farmer and responded to by Dr. V. E. Bowers, president of the association. The minutes of the last annual meeting and of the Board of Directors' meetings was read by the secretary. The president and secretary read their annual reports, and Dr. Geo. McVey, chairman of the A. O. A. constitutional committee and also of the legislative committee, made a report for each of those committees. Judge Orvel Johnson, legal adviser, delivered an interesting address on "National Optometry."

T. J. Mitchell, manager of the Oklahoma City branch of the Riggs Optical Co., asked for the privilege of the floor to make an announcement. In his announcement to the convention he stated that beginning May 10th, 1925, the Riggs Optical Co. would sell optical goods and fill prescriptions for no one in the state of Oklahoma, unless they be a licensed optometrist or physician. His company was taking this step, he said, not only in fairness to the legalized refractionist, but in fairness to the public in general, that they realized that glasses being sold over the counter without an eye examination was doing incalculable harm to the people of Oklahoma, and that in the future the Riggs Optical Co. would refuse to be party to the transaction.

After lunch the election of officers for the ensuing year was held with the following results: President, Dr. V. E. Bowers, Lawton, re-elected; first vice-president, Dr. H. S. Hannis, Tulsa; second vice-president, Dr. R. A. Dieman, Okmulgee; secretary-treasurer, Dr. E. B. Alexander, Duncan, re-elected. Executive Committee, Dr. W. K. Grady, Stillwater. Delegates to the national convention, Dr. V. E. Bowers, Dr. E. B. Alexander, Dr. Geo. McVey, Dr. R. C. Everts, Dr. F. H. Robertson. It was voted to recommend Dr. F. H. Robertson, Blackwell, to the governor for reappointment on the State Board of Examiners.

Unfinished and new business was then taken up. The secretary outlined a new money-raising plan for the Optometric Extension Fund. This plan was adopted and several hundred dollars was raised immediately for this work from the membership present.

By unanimous vote the work of the legal adviser, Col. Orvel Johnson, was highly endorsed for the past year, and the convention recommended to the Board of Directors that they retain the services of Attorney Johnson in the association's legal matters.

The post-graduate clinic held Tuesday and Wednesday of the convention was a huge success. Considerable publicity had been given the clinic, articles concerning it appearing in practically every newspaper in the state. Two clinics were run all day Tuesday and Wednesday, one the educational clinic, conducted by Dr. A. M. Skeffington, the national clinician, and the other, a free public clinic, conducted by various members of the association. About sixty-five patients were examined in the two clinics and it is conservatively estimated that at least one thousand patients were turned away from the free clinic. Patients came to the clinic from all over the state of Oklahoma, and in most cases had to be

sent back home without an examination. The response to the free clinic was far beyond anything expected, but clearly demonstrated the possibilities of this method of optometric publicity. The educational clinic was a revelation. Dr. Skeffington handled his subjects in such a way that all could easily understand his methods and technique. The optometrists crowded into the clinic rooms early Tuesday morning, and few left, except to eat and sleep, until late Wednesday night. Unlimited good was accomplished by the clinic from an educational standpoint, but if possible, still more good was derived by optometry, from the great amount of publicity given it. While in Oklahoma City, Dr. Skeffington spoke before all of the civic clubs and several of the schools.

Summary of Secretary's Report

Dr. E. B. Alexander, secretary of the Oklahoma Association of Optometrists, in reviewing the year's activities pointed out in his report that a harmful bill had been killed in the senate, the "self-testing machines" and the eyeglass peddlers had been largely driven from the state and a considerable amount of optometric publicity secured, the standards of the practitioners raised and the membership increased to 136. This he considered splendid, inasmuch as there are only 166 eligible optometrists in the state.

AN ERROR

Mr. R. E. Webster, general manager of the C. V. Lens Co. of Rochester, New York, and nephew of the late Dr. Cross, writes to inform us that Dr. Andrew Jay Cross died on April 9th rather than on April 16th, as stated in the May issue of this Journal.—(Editor, Northwest Journal of Optometry.)

UTAH OPTOMETRIC ASSOCIATION

Utah raised its optometric scholastic requirements during the last session of the legislature to a minimum of 2,000 clock hours, covering a period of at least two years in an optometric college, writes Dr. E. E. Keller, secretary of the Utah Optometric Association, from Salt Lake City. He further adds that this was done without the expenditure of a single dollar. This is unique in the annals of optometric legislative experience and the men of Utah are to be congratulated on the splendid law now in force in their state.—(Editor, Northwest Journal of Optometry.)

OMAHA CONVENTION

Two splendid clinics were held in Omaha on May 6th and 7th. The first, a post-graduate clinic held under supervision of Dr. A. M. Skeffington of Kearney, Neb., chief post-graduate clinician of the American Optometric Association, and the second one for automobile drivers, conducted by Dr. Fred Gonder of Omaha and Dr. Halan P. Blaine of Norfolk, Neb., were the outstanding features of the eighteenth annual convention of the Nebraska Optometric Association held at the Hotel Fontenelle.

Altogether, more than fifty persons were examined at both clinics and the latest ideas of the profession were explained by the clinicians in such a manner as to be helpful to the delegates in their own practices when they returned to their homes.

At the annual election of officers held on the second day of the convention, Dr. L. C. Hewitt of Neligh was elected president; Dr. Fred Gonder of Omaha was chosen secretary-treasurer and Drs. A. W. Niehart of Elmwood and F. M. Merrick of Auburn were elected first and second vice-presidents, respectively. The retiring officers, in addition to Dr. Perrigo, were Dr. B. G. Bauman of Alliance, second vice-president, and Dr. R. E. Garland of Beatrice, secretary-treasurer. Dr. Hewitt had been first vice-president.

SOUTH DAKOTA ASSOCIATION

The annual convention of the South Dakota Optometric Association was held at Mitchell, S. D., April 28th and 29th. Dr. A. M. Skeffington, national clinician of the A. O. A., conducted an optometric clinic with its usual success. Dr. R. C. Colberg was re-elected president and Dr. H. L. Knudson was re-elected secretary of the association for the following year. The association adopted the A. O. A. code of ethics.

MINNESOTA STATE ASSOCIATION BULLETIN

By Dr. J. I. Kurtz, Secretary
"Attend the Kentucky Derby" at Louisville

The American Optometric Association's convention will be held June 15th to 20th at Louisville, Ky. We learn from advance information that the convention committee has arranged the biggest and best program the A. O. A. has ever had.

The best educators in the country will appear on the program. You will have a chance to learn about the latest developments in the field of Optics and Optometry. Many new instruments which have been invented recently will be on exhibit. You will have a chance to have them demonstrated and get the first-hand information. Come and rub shoulders with the big men in optometry. One new idea you may learn from them will more than repay you for your time and expense of going to the convention.

Plan to have your vacation this year during the month of June and attend the A. O. A. convention at that time. Not only are we assured that the educational program will surpass any previous affairs ever arranged before from a scientific standpoint, but the entertainment program will also be the best ever offered. The arrangement committee insists that the delegates shall have both profit and pleasure. Profit from the great educational program and have pleasure between the sessions.

Kentucky is known for its hospitality and this is particularly true of Louisville. The boys there are preparing a royal welcome and a grand time for us. Let us not disappoint them. If you are going to the convention, notify the office of your state secretary, as we are planning to make up a party of Minnesota men and take a special car.

For room reservations write to R. L. Keserling, 502 So. 3rd St., Louisville, Kentucky.

SOUTHERN MINNESOTA ASSOCIATION

A most successful meeting of the Southern Minnesota Association was held at the Saulpaugh Hotel, Mankato, Minnesota. About twenty Optometrists from the southern part of the state were present and all experienced a very enjoyable evening.

The following officers were elected for the coming fiscal year, namely: Dr. W. W. Arms, Owatonna, president; Dr. H. O. Schleuder, New Ulm, vice-president; Dr. W. H. Nordin, secretary-treasurer.

The following members were taken into the society: Dr. Theo. G. Mahler, Le Sueur, Minn.; Dr. G. B. Johnston, Pipestone, Minn.; Dr. Clayton N. Wulff, Albert Lea, Minn.; Dr. E. Thoreson, Winnebago, Minn.; Dr. A. E. Tillish, Mankato, Minn.; Dr. Stan A. Smith, Mankato, Minn.; Dr. F. A. Fischer, Springfield, Minn.

The program of the evening was as follows:

Program

1. Reception of members at Prey's Optical Shop Tuesday afternoon.
2. Six-o'clock banquet at the Saulpaugh Hotel.
3. Business meeting. Election of officers for coming year. New business.
4. Talk on General Optometric Conditions in U. S. A., Dr. E. H. Kiekenapp.
5. Discussion on several Optical Problems, Dr. H. C. Prey.
6. Optometrical Clinic: Dr. H. O. Schleuder, Dr. J. L. Kubicek, Dr. Walter B. Lyon.

Every member took part in the above discussion and clinic.

MINNESOTA STATE BOARD

Dr. E. Kiekenapp, secretary of the Minnesota State Board of Optometry, informs us that twenty-seven applicants presented themselves before the board for examination, and the following were successful: Drs. Austin E. Engel, 2415 Upton Ave. N., Minneapolis, Minn.; Chester P. Rochat, Ada, Minn.; Joseph W. Tucker, 12 E. 7th St., St. Paul, Minn.; Clarence S. Jorgenson, 1856 Humboldt Blvd., Chicago, Ill.; Wm. O. Jensen, Stuart, Iowa.

MINNEAPOLIS SOCIETY

Dr. J. A. Heidbrink, dentist of this city, gave an illustrated talk on Focal Infections and Radiography before the Minneapolis Association of Optometrists on May 20th. Dr. Heidbrink is the foremost extractionist of Minneapolis and a nationally known authority on his subject, and the talk was both instructive and interesting. A short business session was held before the talk. Dr. L. L. DeMars, president of the society, presided.

A detailed report of Dr. Heidbrink's talk and the discussion following will be published in the Society Proceedings Department in the July issue of this journal.

CONTRIBUTORS TO THE LEGISLATIVE FUND

Drs. M. Bondelid of Duluth and Ernest Schmidt of Howard Lake have contributed to the Minnesota State Legislative Fund since the original list was published in the last issue of this journal.

OKLAHOMA BOARD TO MEET

The mid-year examinations in optometry before the Oklahoma State Board of Optometry will be held at the Shitvin Hotel in Oklahoma City on June 29th and 30th. Applicants who have not already done so should correspond at once with the secretary, Dr. F. H. Robertson of Blackwell, Oklahoma, for permission to appear before the board.

CENTRAL FLORIDA ASSOCIATION

The Central Florida Optometric Association held its regular meeting at Orlando on May 10th with a large attendance. Matters pertaining to the coming state convention were discussed and officers for the ensuing year elected as follows: Dr. G. L. Mandaville, Titusville, president; Dr. F. R. Seymour, St. Cloud, vice-president; Dr. Henry McLaulin, Jr., secretary-treasurer.

A. O. A. CONVENTION SPEAKERS

Dr. R. M. Peckham

Dr. Peckham, optometrist of Waterbury, Conn., is one of the country's foremost refractionists and a deep student of ocular myology.

Professor Howard Minchin

Prof. Minchin is in charge of the optometry department of the Ohio State University, and will probably speak on mathematical optics, a subject which he can cover splendidly.

Dr. F. P. Barr

Dr. Barr is an optometrist connected with the scientific staff of the Bausch & Lomb Optical Co. and will probably talk on some phase of color vision.

Dr. J. I. Pascal

Dr. Pascal is Dean of the American Institute of Optometry of New York City. He has been frequently heard at national conventions, and is always an addition to any program.

Dr. Geo. T. Warren

Dr. Warren, an optometrist of Washington, D. C., is a special writer for the Optical Journal and Review. Dr. Warren will discuss refractive problems.

Dr. E. H. Silver

Dr. Silver, a practitioner of Washington, D. C., will talk on cranial nerves, using slides and a manikin.

Dr. A. M. Skeffington

Dr. Skeffington, National Clinician for the A. O. A., will, with a staff of assistants, conduct visual clinics. This was the feature of the 1924 convention and should prove as helpful as ever.

CURRENT LITERATURE

These are the titles of papers bearing on optometry, or papers written in such a manner as to be of interest to optometrists. These papers appear in various optometric and ophthalmic publications, as indicated. The papers have been grouped under appropriate heads, and in each group arranged alphabetically, usually by the Author's name in **heavy face type.** The abbreviations mean: (Ill.), illustrated; (Pl.), plates; (Abst.), indicates that it is an abstract of the original article; and (Dis.), that discussion is published with paper.

GENERAL REFRACTION

Adler, F. H. Demonstrations of Normal and Abnormal Pupillary Reflexes. Amer. Jour. of Oph. Series 3, Vol. 8, No. 4, pp. 287-289.

Barkan, H. Hemeratopia Lantern of Hess. (Ill.) Amer. Jour. of Oph. Series 3, Vol. 8, No. 5, pp. 412-413.

Blakmar, F. B. A Scotoma Plate Attachment for Perimeters. (Ill.) Amer. Jour. of Oph. Series 3, Vol. 8, No. 5, pp. 377-380.

Duane, A. Are the Current Theories of Accommodation Correct? (Ill.) Amer. Jour. of Oph. Series 3, Vol. 8, No. 3, pp. 196-202.

Duke-Elder, W. S. Changes in Refraction in Diabetes Mellitas. Brit. Jour. of Oph. Vol. IX, No. 4, pp. 167-187. Abstracted in the N. W. Jour. of Optom. Vol. 2, No. 5, pp. 133-135.

Fjelstad, E. O. Punktal Lenses. N. W. Jour. of Optom. Vol. 2, No. 5, pp. 130-132.

Freeman, W. V. The Gullstrand Ophthalmoscope. N. W. Jour. of Optom. Vol. 2, No. 5, pp. 132-133.

Friedenwald, J. S. Ophthalmoscopy with Yellow-Green Light. (Pl.) Amer. Jour. of Oph. Series 3, Vol. 8, No. 3, pp. 177-179. Abstracted in the N. W. Jour. of Optom. Vol. 2, No. 5, p. 135.

Howard, A. B. Hyperopia. The Opt. Jour. and Rev. Vol. LV, No. 16, pp. 29-32.

Jack, R. J. B. Astigmatism and the Subjective Tests. The Opt. Jour. and Rev. Vol. LV, No. 15, pp. 33-34.

Jellings, C. N. T. Accommodation. The Opt. (Brit.). Vol. LXIX, No. 1776, pp. 145-146.

Johnson, L. Theory of Accommodation. (Abst.) Amer. Jour. of Oph. Series 3, Vol. 8, No. 2, p. 259.

Lawson, A. Lens Tints and Their Values. (Pl.) The Brit. Jour. of Oph. Vol. IX, No. 3, pp. 97-109. Abstracted in the N. W. Jour. of Optom. Vol. 2, No. 5, p. 136.

Llewwllyn, T. N. Etiology of Nystagmus. (Abst.) N. W. Jour. of Optom. Vol. 2, No. 5, p. 136.

Lloyd, R. I. Field Study. Amer. Jour. of Phy. Optics. Vol. VI, No. 2, pp. 129-140.

MacRae, A. Technic of Refraction. E. E. N. & T. Mo. Vol. IV, No. 3, pp. 153-156.

Nordstrom, A. O. Temporary Partial Paralysis of the Accommodation. N. W. Jour. of Optom. Vol. 2, No. 5, pp. 132.

Olsho, S. L. A Test Screen and a Familiar Test Chart. (Ill.) Amer. Jour. of Oph. Series 3, No. 8, No. 3, pp. 192-195. Abstracted in the N. W. Jour. of Optom. Vol. 2, No. 5, p. 137.

Parker, J. W. The Oculometer. (Ill.) The Opt. Jour. and Rev. Vol. LV, No. 19, p. 46.

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